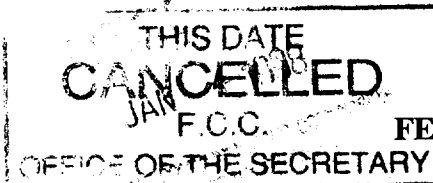


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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY



Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

In the Matter of )

Amendment of Part 15 of the Commission's )  
Rules to Allow Certification of )  
Equipment in the 24.05 to 24.25 GHz Band )  
at Field Strengths up to 2500 mV/m )

ET Docket No. 98-156

To: The Commission

**REPLY COMMENTS OF THE  
AMERICAN RADIO RELAY LEAGUE, INCORPORATED**

The American Radio Relay League, Incorporated (the League), the national association of amateur radio operators, by counsel, hereby respectfully submits its reply comments in the captioned proceeding, pursuant to the *Notice of Proposed Rule Making* (the Notice), FCC 98-156, released September 1, 1998. The League's reply comments are principally in response to comments filed by Sierra Digital Communications, Inc. (Sierra),<sup>1</sup> which predictably support the Commission's proposal to amend Part 15 of the Commission's Rules governing unlicensed radio frequency (RF) devices, in order to permit the use of fixed, point-to-point transmitters in the 24.05-24.25 GHz band at field strengths up to 2.5 volts per meter, measured at 3 meters.

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<sup>1</sup> Comments were also timely filed by Teligent, Inc., but its concern was with respect to interference from high-powered unlicensed point-to-point operation at 24.05-24.25 GHz to digital electronic messaging service (DEMS) operation at 24.25-24.45 GHz. The League has no interest in this band, but notes that the Commission proposes to allow high-powered, unlicensed devices to operate at high antenna gains immediately adjacent to licensed DEMS band. The same interference concerns expressed by Teligent apply with greater urgency to co-channel operation of amateur stations and high-powered Part 15 devices.

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In reply to those comments, the League states as follows:

1. It is apparent on the face of the Notice proposal, and Sierra offers nothing by way of mitigation, that the proposed power level and antenna gain figures are entirely inappropriate for Part 15 unlicensed facilities. What the Commission has proposed, and what Sierra supports, amounts to a request that additional spectrum be allocated for fixed applications. There is, however, ample microwave spectrum already allocated for fixed applications, and no compelling reason has been stated for the Commission to make more available at the expense of other radio services, and other radio applications. If there is a greater need for short-distance, low-cost fixed service links than for long-distance links, the Commission should address that within its service rules for the fixed service. The Commission assumes, but the record does not show (and there are no market studies which would indicate) any need for additional fixed point-to-point microwave facilities.

2. Even the most cursory review of Section 101.101 of the Commission's rules shows the availability of vast amounts of fixed service spectrum for both common carrier and POFS applications, in frequency bands that permit long-distance and short-range paths. There is no showing in the Notice, and neither Sierra nor the Commission has otherwise asserted, that the bands between 928 MHz and 40 GHz are insufficient to accommodate the exact same applications as proposed in the Notice. As to the issue of the "burden" of licensing (a burden not deemed significant to Congress, apparently, given its retention of licensing requirements in Section 301 of the Communications Act for more than sixty years) it is noted that, upon completion of frequency coordination, an applicant for a point-to-point microwave facility may, pursuant to Section 101.31, commence operations during the application period. There is thus

no significant delay in commencement of operation of new or modified facilities. Given the availability of spectrum for fixed facilities, the convenience of the licensing process under Part 101, and the speed of commencement of operations under the special temporary authority and conditional authorization provisions,<sup>2</sup> there is no justification whatsoever for the effective allocation of additional fixed service spectrum by means of an uncoordinated, unlicensed communications service into the 24 GHz band, at the expense of the Amateur Service.

3. Sierra argues that because unlicensed spread-spectrum devices are permitted to utilize unlimited EIRPs in the 5.725-5.850 GHz band, and with relatively high antenna gains in the 2.400-2.483.5 GHz band, the high-power, high-gain, non-spread-spectrum devices proposed in the Notice should be treated similarly. First of all, given the accommodation of high-powered, Part 15 spread-spectrum devices in the 2.4 and 5.7 GHz bands for point-to-point operation, there is no reason why the Commission need proceed with the proposal advocated by Sierra in the 24 GHz band. It is apparent from Sierra's own argument that the same types of communications which would be conducted at 24 GHz can be conducted using spread-spectrum devices in the 2.4 and 5 GHz bands. Second, as noted in the League's comments, spread-spectrum devices have inherently less interference potential to co-channel licensed facilities than do narrowband devices. If Sierra wishes to make the argument that high-powered, high-gain narrowband Part 15 devices

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<sup>2</sup> Sierra states that "(c)ertification of a new device to offer a new service typically takes just a few weeks, in contrast with the minimum of a year or two for a rulemaking to authorize a new licensed service. Part 15 users can deploy facilities as fast as their needs arise, without having to wait weeks for frequency coordination and application processing". This is nonsense. A new fixed facility can be coordinated and on the air with conditional authorization in a few days, not weeks, and the rulemaking reference is totally out of place. Sierra's device offers nothing new; it is plain vanilla point-to-point microwave operation, which does not necessitate any rulemaking whatsoever.

should be permitted at 24.05-24.25 GHz because the Commission allows such at 2.4 and 5.7 GHz, it must be willing to accept the requirement that 24 GHz operation be limited to spread-spectrum, direct-sequence or frequency-hopped devices with substantial bandwidth spreading. As it stands, Sierra's comparison of spread-spectrum devices and its own narrowband devices is specious.<sup>3</sup> A high antenna gain, point-to-point narrowband device at the proposed power level has an interference contour in the main antenna lobe that stretches for many miles. The Commission has made accommodation for unlicensed spread spectrum devices at 2.4 and 5.7 GHz. It is now unable to evaluate either: (1) the sufficiency of those actions relative to any need<sup>4</sup> for unlicensed point-to-point devices, or (2) aggregate interference to licensed services from those devices in those bands. Therefore, the Commission cannot justify proceeding to authorize more of the same thing in a different band. This proceeding must be terminated without action, at least for a few years, until the effect of the Commission's prior actions relative to unlicensed, point-to-point Part 15 devices in other microwave bands is determined.

4. Sierra next argues that the Commission's prohibition of high-power point-to-point

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<sup>3</sup> Furthermore, Sierra cannot rely on any compatibility between amateur facilities at 2.4 or 5.7 GHz and spread-spectrum devices at those frequencies using unlimited, or relaxed limitations on, EIRP. The Commission's rules for those devices are not old enough to allow product lines to have been developed, and the actual interference from those devices to amateur stations cannot be evaluated at present. The aggregate effect of such devices in those bands on amateur and other licensed facilities is unclear, and will be for some time. That the Commission decided to allow spread-spectrum devices with liberal operating parameters at 2.4 and 5.7 GHz is therefore precedent for nothing.

<sup>4</sup> The record in this proceeding is devoid of any showing of need for additional fixed, point-to-point unlicensed devices, and indeed such a showing is impossible; the Commission has only recently made extensive accommodation for such uses in the 2.4 and 5.7 GHz bands, and devices for those bands are not yet significantly deployed. No showing of need for additional high-powered, point-to-point devices can be established presently.

operation at 24.00-24.05 GHz to protect the Amateur-Satellite Service is unnecessary. It cites certain technical characteristics of the amateur Phase 3D satellite, now awaiting launch, and draws certain conclusions from its analysis. Sierra's purely anecdotal calculations, however, are establish nothing. The Phase 3D satellite is but one of the many amateur satellites under development, and which will be implemented in the future. Other amateur satellites will have different operating characteristics, and there is no generalization possible. Thus, Sierra has not and cannot establish that interference will not occur to amateur satellites in the 24.00-24.05 GHz band. Since deployed, high-powered, Part 15 point-to-point microwave facilities cannot be recalled at a later date, after a new amateur satellite is launched, interference could arise at a later date, which the Part 15 user would be obligated to resolve, (a process that is problematic at best). There is thus no justification offered by Sierra for the authorization of such devices in the Amateur-Satellite segment.

5. Sierra's technical analysis is incorrect in several respects, in any case. The Phase 3D satellite is not a low earth orbit satellite. It will move rather slowly at apogee. Sierra's assumption that it is only useful at 30 degree elevations above the horizon is not correct. At page 7 of its comments, Sierra makes certain assumptions concerning noise temperature and receiver sensitivity which are incorrect. As a matter of fact, at 30 kelvins background, the system thermal noise power is -201.1 dBW. At 50 kelvins, it is -201.0 dBW/Hz and at 290 kelvins, it is -199.5 dBW/Hz. Given the typical 4 dB receiver noise floor, and 0.5 dB transmission line loss, the difference in system noise between 30 and 300 kelvins is only 1.6 dB. Thus, there is no requirement that the satellite be "well above the horizon", and no basis for the statement that satellite antennas will "most likely point" 30 degrees above the horizon. The location of the

antenna is dependent on the particular orbit. Furthermore, it is quite possible that interfering signals would reflect from metal structures, such as water towers or nearby communications towers or antennas. There is thus significant interference potential from high-powered 24 GHz Part 15 devices to amateur satellite communications. Sierra next suggests that the only place that its devices should be restricted, at most, is at 24.048-24.049 GHz. That is the segment used by the Phase 3D satellite, but the Amateur Satellite Program cannot be limited to that segment by the presence of Part 15 devices. The investment of radio amateurs in satellite technology and development is extensive. A number of new satellites are in the process of preparation, and the Amateur Satellite Program has resulted in many important technical developments and contributions, most recently the development of low-earth-orbit satellites. The suggested authorization of high-power Part 15 devices in the Amateur-Satellite allocation is imprudent.

6. Neither has Sierra addressed the substantial number of terrestrial amateur weak-signal stations active at 24 GHz, most of which activity is centered at 24.192 GHz, which utilizes the same sensitive receivers as do amateur satellite communications in that band. As can be seen from the standard reference circuits attached to the League's comments in this proceeding, it is apparent that typical amateur stations will be subject to substantial interference from the proposed Part 15 devices over the long terrestrial transmission paths used by amateurs. Particularly alarming in this respect is Sierra's argument at Page 2 of its comments, to the effect that the Part 15 status of these devices is beneficial because the Commission is spared the burden of granting and renewing licenses and adjudicating disputes among licensees. The exact benefit of the coordination procedure and the licensing process, however, is the avoidance of interference between and among stations *ab initio*, so that the Commission won't *have* to

adjudicate disputes between and among licensees. Allowing unspecified, high-powered, high antenna gain, point-to-point devices in this band, where conflicts with radio amateurs are inevitable,<sup>5</sup> will result in significantly increased enforcement concerns for the Commission. The Part 15 devices carry no station identification, and the users are not likely to cease operation in the event of reported interference to amateur communications. The Commission must at some point acknowledge the fact that Part 15 devices are allowed under the Communications Act only where they have no interference potential to licensed services. If they have such potential, they cannot be operated or authorized to operate on an unlicensed basis. There are numerous instances of interference between amateur stations and narrowband Part 15 devices in other bands, operating at far lower power levels than the 2.5 V/m sought here, and the incompatibility between the two uses at 24 GHz is obvious. It is not the League's burden to prove that interference will occur; it is the petitioner's burden, and the Commission's obligation under the Communications Act to prove that interference will *not* occur to licensed services. That is the admission ticket for unallocated, unlicensed devices in any band. In this respect, the burden has not been met.

7. In summary, the Commission has no basis to conclude that there will not be significant interference to the Amateur Service from 2.5 volt-per-meter directional signals from point-to-point unlicensed microwave facilities at 24 GHz. Sierra has offered no accurate technical

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<sup>5</sup> Sierra takes comfort in the suggestion that its Part 15 devices would have "no conceivable application" in residential areas, where much amateur operation takes place. Terrestrial 24 GHz amateur operation takes place not only in residential areas, but at high locations using portable and itinerant installations for equipment and propagation testing. There can be no generalization as to the location of amateur 24 GHz operation, and there are proposed no limitations on the use of 24 GHz Part 15 devices, so interference avoidance based on geographic separation between fixed and itinerant uses is impossible in this instance.

analysis, and no facts, that would justify such. The Commission especially cannot allow these devices in the Amateur-Satellite segment at 24.00-24.05 GHz, as such would disrupt Amateur-Satellite communications. The same rationale for protecting those communications applies to terrestrial amateur weak-signal communications, especially that centered at 24.192 GHz. There are substantial interference contours created by the proposed Part 15 devices many miles from the transmitters, and there is no practical means of avoiding the interference, or resolving it, when it is experienced.

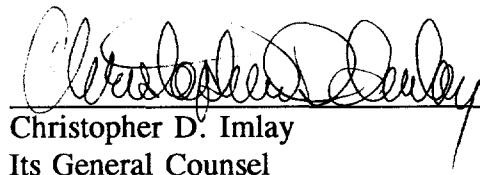
Therefore, the foregoing considered, the American Radio Relay League, Incorporated respectfully requests again that this proceeding be terminated without action, and that no change in existing Part 15 regulations governing the 24.00-24.05 GHz band be implemented.

Respectfully submitted,

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January 4, 1999



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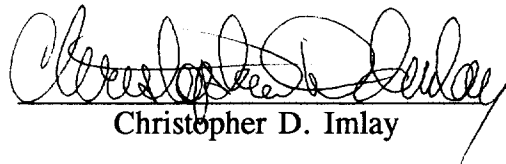
I, Christopher D. Imlay, a Principal of the law firm of Booth, Freret, Imlay & Tepper, P.C., do hereby certify that copies of the foregoing REPLY COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED were mailed this 4th day of January, 1999, via U. S. Mail, postage prepaid, first class, to the offices of the following:

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